



4453us.ST25.txt
SEQUENCE LISTING

<110> Ankenbauer, Waltraud
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Elizaveta, Bonch-Osmolovskaya
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Angerer, Bernhard
Laue, Frank

<120> Thermostable Nucleic Acid Polymerase From Thermococcus gorgonarius

<130> 4453

<140> US 09/269,860

<141> 1999-04-01

<150> PCT/EP97/05393

<151> 1997-10-01

<150> EP/97100584.8

<151> 1997-01-16

<150> EP/96115874.8

<151> 1996-10-03

<160> 9

<170> PatentIn version 3.0

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ggcctacgag aggaacgaac tggc 24

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ggcgttagatg tagggctc 18

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agcctgcagt catgtcttag gtttagcccg

33

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<213> Thermococcus gorgonarius

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Met Ile Leu Asp Thr Asp Tyr Ile Thr Glu Asp Gly Lys Pro Val Ile
1 5 10 15

48

agg atc ttc aag aag gag aac ggc gag ttc acc ata gac tac gac aga
Arg Ile Phe Lys Lys Glu Asn Gly Glu Phe Thr Ile Asp Tyr Asp Arg
20 25 30

96

aac ttt gag cca tac atc tac gcg ctc ttg aag gac gac tct ccg att
Asn Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Pro Ile
35 40 45

144

gag gac gtc aag aag ata act gcc gag agg cac ggc act acc gtt agg
Glu Asp Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Thr Val Arg
50 55 60

192

gtt gtc agg gcc gag aaa gtg aag aag aag ttc cta ggc agg ccg ata
Val Val Arg Ala Glu Lys Val Lys Lys Phe Leu Gly Arg Pro Ile
65 70 75 80

240

gag gtc tgg aag ctc tac ttc act cac ccc cag gac gtt ccc gca atc
Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
85 90 95

288

agg gac aag ata aag gag cat cct gcc gtt gtg gac atc tac gag tac
Arg Asp Lys Ile Lys Glu His Pro Ala Val Val Asp Ile Tyr Glu Tyr
100 105 110

336

gac atc ccc ttc gcg aag cgc tac ctc ata gac aaa ggc tta atc ccg
Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile Pro
115 120 125

384

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atg gag ggc gac gag gaa ctt aag atg ctc gcc ttc gac atc gag acg	130	135	140	432
Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr				
ctc tat cac gag ggc gag gag ttc gcc gaa ggg cct atc ctg atg ata	145	150	155	480
Leu Tyr His Glu Gly Glu Phe Ala Glu Gly Pro Ile Leu Met Ile				
agc tac gcc gac gag gaa ggg gcg cgc gtt att acc tgg aag aat atc	165	170	175	528
Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Ile				
gac ctt ccc tat gtc gac gtc gtt tcc acc gag aag gag atg ata aag	180	185	190	576
Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys				
cgc ttc ctc aag gtc gtc aag gaa aag gat ccc gac gtc ctc ata atc	195	200	205	624
Arg Phe Leu Lys Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Ile				
tac aac ggc gac aac ttc gac ttc gcc tac ctc aag aag cgc tcc gag	210	215	220	672
Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Ser Glu				
aag ctc gga gtc aag ttc atc ctc gga agg gaa ggg agc gaa ccg aaa	225	230	235	720
Lys Leu Gly Val Lys Phe Ile Leu Gly Arg Glu Gly Ser Glu Pro Lys				
atc cag cgc atg ggc gat cgc ttt gcg gtg gag gtc aag gga agg att	245	250	255	768
Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile				
cac ttc gac ctc tac ccc gtc att agg aga acg att aac ctc ccc act	260	265	270	816
His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr				
tac acc ctt gag gca gta tat gaa gcc atc ttt gga cag ccg aag gag	275	280	285	864
Tyr Thr Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Gln Pro Lys Glu				
aag gtc tac gct gag gag ata gcg cag gcc tgg gaa acg ggc gag gga	290	295	300	912
Lys Val Tyr Ala Glu Glu Ile Ala Gln Ala Trp Glu Thr Gly Glu Gly				
tta gaa agg gtg gcc cgc tac tcg atg gag gac gcg aag gta acc tat	305	310	315	960
Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr				

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gaa ctc gga aaa gag ttc ttc cct atg gaa gcc cag ctc tcg cgc ctc	325	330	335	1008	
Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu					
gta ggc cag agc ctc tgg gat gta tct cgc tcg agt acc gga aac ctc	340	345	350	1056	
Val Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu					
gtc gag tgg ttt ttg ctg agg aag gcc tac gag agg aat gaa ctt gca	355	360	365	1104	
Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala					
cca aac aag ccg gac gag agg gag ctg gca aga aga agg gag agc tac	370	375	380	1152	
Pro Asn Lys Pro Asp Glu Arg Glu Leu Ala Arg Arg Arg Glu Ser Tyr					
gcg ggt gga tac gtc aag gag ccc gaa agg gga ctg tgg gag aac atc	385	390	395	400	1200
Ala Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile					
gtg tat ctg gac ttc cgc tcc ctg tat cct tcg ata ata atc acc cat	405	410	415	1248	
Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His					
aac gtc tcc cct gat aca ctc aac agg gag ggt tgt gag gag tac gac	420	425	430	1296	
Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Glu Glu Tyr Asp					
gtg gct cct cag gta ggc cat aag ttc tgc aag gac ttc ccc ggc ttc	435	440	445	1344	
Val Ala Pro Gln Val Gly His Lys Phe Cys Lys Asp Phe Pro Gly Phe					
atc cca agc ctc ctc gga gac ctc ttg gag gag aga cag aag gta aag	450	455	460	1392	
Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Val Lys					
aag aag atg aag gcc act ata gac cca atc gag aag aaa ctc ctc gat	465	470	475	480	1440
Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Lys Lys Leu Leu Asp					
tac agg caa cga gca atc aaa atc ctt gct aat agc ttc tac ggt tac	485	490	495	1488	
Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Phe Tyr Gly Tyr					
tac ggc tat aca aag gcc cgc tgg tac tac aag gag tgc gcc gag agc	500	505	510	1536	
Tyr Gly Tyr Thr Lys Ala Arg Trp Tyr Tyr Lys Glu Cys Ala Glu Ser					

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gtt acc ggt tgg ggc agg gag tac atc gag acc acg ata agg gaa ata	515	520	525	1584
Val Thr Gly Trp Gly Arg Glu Tyr Ile Glu Thr Thr Ile Arg Glu Ile				
gag gag aaa ttt ggc ttt aaa gtc ctc tac gcg gac aca gat gga ttt	530	535	540	1632
Glu Glu Lys Phe Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Phe				
ttc gca aca ata cct gga gcg gac gcc gaa acc gtc aaa aag aag gca	545	550	555	1680
Phe Ala Thr Ile Pro Gly Ala Asp Ala Glu Thr Val Lys Lys Lys Ala				
aag gag ttc ctg gac tac atc aac gcc aaa ctg ccc ggc ctg ctc gaa	565	570	575	1728
Lys Glu Phe Leu Asp Tyr Ile Asn Ala Lys Leu Pro Gly Leu Leu Glu				
ctc gaa tac gag ggc ttc tac aag cgc ggc ttc ttc gtg acg aag aag	580	585	590	1776
Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr Lys Lys				
aag tac gcg gtt ata gac gag gag gac aag ata acg acg cgc ggg ctt	595	600	605	1824
Lys Tyr Ala Val Ile Asp Glu Glu Asp Lys Ile Thr Thr Arg Gly Leu				
gaa ata gtt agg cgt gac tgg agc gag ata gcg aag gag acg cag cgc	610	615	620	1872
Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala				
agg gtt ctt gag gcg ata cta aag cac ggt gac gtt gaa gaa gcg gta	625	630	635	1920
Arg Val Leu Glu Ala Ile Leu Lys His Gly Asp Val Glu Glu Ala Val				
agg att gtc aaa gag gtt acg gag aag ctg agc aag tac gag gtt cca	645	650	655	1968
Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro				
ccg gag aag ctg gtc atc tac gag cag ata acc cgc gac ctg aag gac	660	665	670	2016
Pro Glu Lys Leu Val Ile Tyr Glu Gln Ile Thr Arg Asp Leu Lys Asp				
tac aag gcc acc ggg ccg cat gtg gct gtt gca aaa cgc ctc gcc gca	675	680	685	2064
Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala				
agg ggg ata aaa atc cgg ccc gga acg gtc ata agc tac atc gtg ctc	690	695	700	2112
Arg Gly Ile Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu				

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aaa ggc tcg gga agg att ggg gac agg gct ata ccc ttt gac gaa ttt	2160
Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe	
705 710 715 720	
gac ccg gca aag cac aag tac gat gca gaa tac tac atc gag aac cag	2208
Asp Pro Ala Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln	
725 730 735	
gtt ctt cca gct gtg gag agg att ctg agg gcc ttt ggt tac cgt aaa	2256
Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys	
740 745 750	
gaa gat tta agg tat cag aaa acg cgg cag gtt ggc ttg ggg gcg tgg	2304
Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp	
755 760 765	
cta aaa cct aag aca tga	2322
Leu Lys Pro Lys Thr	
770	
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Arg Ile Phe Lys Lys Glu Asn Gly Glu Phe Thr Ile Asp Tyr Asp Arg	
20 25 30	
Asn Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Pro Ile	
35 40 45	
Glu Asp Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Thr Val Arg	
50 55 60	
Val Val Arg Ala Glu Lys Val Lys Lys Phe Leu Gly Arg Pro Ile	
65 70 75 80	

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Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
85 90 95

Arg Asp Lys Ile Lys Glu His Pro Ala Val Val Asp Ile Tyr Glu Tyr
100 105 110

Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile Pro
115 120 125

Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
130 135 140

Leu Tyr His Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
145 150 155 160

Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Ile
165 170 175

Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys
180 185 190

Arg Phe Leu Lys Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Ile
195 200 205

Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Ser Glu
210 215 220

Lys Leu Gly Val Lys Phe Ile Leu Gly Arg Glu Gly Ser Glu Pro Lys
225 230 235 240

Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
245 250 255

His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
260 265 270

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Tyr Thr Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Gln Pro Lys Glu
275 280 285

Lys Val Tyr Ala Glu Glu Ile Ala Gln Ala Trp Glu Thr Gly Glu Gly
290 295 300

Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr
305 310 315 320

Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
325 330 335

Val Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
340 345 350

Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
355 360 365

Pro Asn Lys Pro Asp Glu Arg Glu Leu Ala Arg Arg Arg Glu Ser Tyr
370 375 380

Ala Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
385 390 395 400

Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
405 410 415

Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Glu Glu Tyr Asp
420 425 430

Val Ala Pro Gln Val Gly His Lys Phe Cys Lys Asp Phe Pro Gly Phe
435 440 445

Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Val Lys
450 455 460

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Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Lys Lys Leu Leu Asp
465 470 475 480

Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Phe Tyr Gly Tyr
485 490 495

Tyr Gly Tyr Thr Lys Ala Arg Trp Tyr Tyr Lys Glu Cys Ala Glu Ser
500 505 510

Val Thr Gly Trp Gly Arg Glu Tyr Ile Glu Thr Thr Ile Arg Glu Ile
515 520 525

Glu Glu Lys Phe Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Phe
530 535 540

Phe Ala Thr Ile Pro Gly Ala Asp Ala Glu Thr Val Lys Lys Ala
545 550 555 560

Lys Glu Phe Leu Asp Tyr Ile Asn Ala Lys Leu Pro Gly Leu Leu Glu
565 570 575

Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr Lys Lys
580 585 590

Lys Tyr Ala Val Ile Asp Glu Glu Asp Lys Ile Thr Thr Arg Gly Leu
595 600 605

Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
610 615 620

Arg Val Leu Glu Ala Ile Leu Lys His Gly Asp Val Glu Glu Ala Val
625 630 635 640

Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
645 650 655

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Pro Glu Lys Leu Val Ile Tyr Glu Gln Ile Thr Arg Asp Leu Lys Asp
660 665 670

Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala
675 680 685

Arg Gly Ile Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
690 695 700

Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
705 710 715 720

Asp Pro Ala Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
725 730 735

Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys
740 745 750

Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
755 760 765

Leu Lys Pro Lys Thr
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36